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NOVA SCOTIA

VOLUNTARY PLANNING BOARD

PLAN FOR THE MINING SECTOR

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JUNE 1966

NOVA SCOTIA VOLUNTARY PLANNING BOARD

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The Chairman and Members
Nova Scotia Voluntary Planning Board

Gentlemen:

I am honoured to present the Plan for the Mining Sector of Nova Scotia's economy for the period 1965 to 1968.

This plan is based on the voluntary work of the several mining industry segment and sector committees.

In general, it was found that the outlook for continued expansion within the mineral based industries is optimistic. Unfortunately, coal is likely to be an exception to this. The outlook for the Nova Scotia coal industry is a cause for deep concern. There is little evidence to suggest that this industry can be restored to a self-supporting basis, at least on its present scale, in the foreseeable future. However, the overriding social implications are such that the industry must be enabled to carry on while answers are being sought to the problems of establishing other means of support for the areas now dependent on this industry.

Mineral resource exploration is continuing at a brisk pace and early results warrant reasonable optimism that new mining industries will be developed in the near future.

The world market for industrial chemicals is undergoing substantial expansion. Nova Scotia is not only strategically located to supply these chemicals but possesses in abundance many of the key mineral

elements and compounds necessary to their production.

It is to potentials such as these that Nova Scotia must look for any outstanding growth in the mining sector industries.

The mining sector committee has put forward a number of recommendations which it feels should improve the environment for further expansion and others which should ease the strains of transition now confronting the coal industry.

Respectfully submitted,

E.D. Brown, Chairman,
Mining Sector Committee,
Voluntary Economic Planning

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I. INTRODUCTION

This report on the Mining Sector of the Nova Scotia economy is one of a series being published by the Nova Scotia Voluntary Planning Board to serve as supplements to the "First Plan".

The "First Plan", while it was based on the integrated conclusions of the many volunteer segments and sector committees, dealt primarily with overall economic goals for Nova Scotia, and the broad strategy for achieving these goals.

The Sector reports will deal specifically with the work of the volunteer sector and segment committees. These committees were requested to a) make critical examinations of their particular industries, b) to pinpoint the barriers obstructing growth and c) to suggest ways and means of overcoming these obstructions, by means of individual or co-operative action.

These committees were also asked to establish growth targets in terms of employment and production for individual years to 1968, plus long range targets for 1972. The chief function of these targets is to provide both a challenge to the industries concerned and a standard with which to measure progress.

In practice, the voluntary committees worked very well indeed. A high degree of enthusiasm was the rule rather than the exception. Individual members gave unstintingly of their time, frequently at substantial expense to themselves. One of the more outstanding benefits accruing from this program was the opportunity provided for Nova Scotia's labour,

business and government leaders to get together and exchange information of common interest. Individuals have been enabled to relate their problems to those of the overall economy. Two way inter-connecting lines of communication have been established. And the groundwork for effective co-operation has been laid. Such preliminary accomplishments are essential to the clarification of economic goals and the co-ordination of effort required to achieve them.

This report contains a brief historical review of the mining industry in Nova Scotia, - an outline of sector committee discussions, - the potentials for mining industry growth, - recommendations of the sector committee, as approved by the Planning Board and tables setting out sector targets.

Additional tables provide historical information on the gross value of Nova Scotia mineral production, together with its various components, employment data and wage and salary information.

A comprehensive analysis of mineral industry data was attempted but had to be abandoned. It was found that this data did not exist in sufficiently consistent and detailed form to be useful. Rarely are enough firms active in any mineral category in Nova Scotia to permit the Dominion Bureau of Statistics to publish detailed aggregate data for the province without danger of the data being identified with an individual firm.

To secure the very limited amount of statistical data included with this report, it was necessary to combine information supplied by the Dominion Bureau

of Statistics and the Nova Scotia Department of Mines. As a result consistency and accuracy have suffered considerably. The reader is cautioned not to attach undue significance to absolute values but to treat the data as a rough guide to overall trends only.

II. HISTORICAL REVIEW OF THE MINING SECTOR

During the 19th Century, mining in Nova Scotia meant coal, gold and iron, roughly in that order of importance, with minor quantities of limestone being produced and, sporadically, antimony, lead, copper and fluorspar.

By 1900, over 3,000,000 tons of coal were being produced and sold annually. Contrary to the current coal import situation, over 600,000 tons were exported to the U.S.A. Gold production reached its all time high of nearly 34,000 ounces annually. Iron production had stopped and resumed again only briefly during part of the next decade before terminating completely. An antimony mine at West Gore was closed but re-opened later for a short period. In 1900, a lively industry had sprung up in North Sydney, making 700,000 silicate bricks, 120,000 tons of gypsum were shipped annually, lead and copper deposits were being investigated, and 50,000 tons of limestone were produced.

Such activity made Nova Scotia the leading mineral producing province of Canada at that time. The Canadian shield had not yet been recognized as a source of minerals; the west coast mineral industry was just starting, except for placer gold, while the oil and potash of the prairies were as yet undreamed of.

From 1900 to 1950, conditions in the Nova Scotia mining industry changed only gradually, with coal becoming continually more dominant. The peak year for coal production was 1913, when over 8,000,000 tons were produced, while twelve other years (including

six war years) saw over 7,000,000 tons of output. In 1950, coal output was still close to 6,500,000 tons.

Output per man shift increased from 2.09 to 2.15 tons between 1900 and 1950. Although this gain was moderate, the ratios were nevertheless greater than those achieved in most other coal producing countries where comparable underground conditions exist, in particular in the United Kingdom - 1.4 short tons per man shift was being produced in 1949.

In the United States coal mining industry the ratio in 1900 was similar to that in Nova Scotia but by 1950 this had climbed in bituminous fields to 6.77 tons per man shift and in the anthracite fields to 2.83 tons per man shift. It should be noted that underground conditions, shallower working depths, thicker coal seams and easier accessibility to the working faces, very much influenced these American productivity figures. In addition, these conditions were more conducive to the successful pursuit of underground mechanization of coal getting and haulage operations.

In fact, the successful exploitation of these superior natural advantages by the American coal mining industry provided it with a substantial competitive edge over the Nova Scotia coal mining industry which will be difficult if not impossible to overcome.

Gold production gradually declined until the depression years, revived late in the 30's and then rapidly dropped to the vanishing point. Gypsum output on the other hand rose to over 3,000,000 tons,

while the combined dolomite and limestone output accounted for over 100,000 tons. Barite had become a regular contributor to Nova Scotia minerals with nearly 80,000 tons shipped. Salt output was just over 100,000 tons, while silica, diatomite and clay products were produced.

The total value of mineral output in 1950 reached over $59,000,000, 84.7% of which was represented by the value of coal.

Since 1950 coal production has gradually declined, but the total value of mineral production has edged upward slightly. Base metal output has in some years shifted the balance away from coal, but a consistent although gradual increase in industrial mineral output has been the significant feature in maintaining growth.

1954 was a record year in that high metallic output coincided with a peak in coal production and a surge of construction activity brought about by the Canso Causeway. Total value of mineral production was $73,451,000. Industrial mineral output that year was valued at $10,280,000, of which gypsum accounted for about half.

By 1963 coal output had declined to 4,600,000 tons, valued at $45,000,000 and industrial mineral output was valued at $15,840,000. Total value of mineral production was $67,307,000. In 1964 the value of coal produced, at $43,357,000, constituted 64.8% of the total value of minerals from the province.

During this post war period, the coal industry broke away from the two tons of output per man

shift which had been normal for the preceding fifty years. In this period, output per man shift has increased by nearly 50% to about three tons. The present comparable figure for the United Kingdom coal industry is 1.9 short tons per man shift which represented an increase of only 26%.

What might be called the modern or post war period has been characterized in Nova Scotia mining by a drop of some 30% in coal output and by a coal mine labor productivity rise of some 50%. Employment has consequently declined by about half. It has further been characterized by a steady 5% per year increase in industrial mineral production. With even greater increases in efficient use of man power, the employment picture has remained fairly static. Construction materials and metal production on the other hand have varied sharply from year to year, their peaks corresponding with occasional record production years for other minerals.

Two other features are of recent historical interest.

With the formation of a geological division within the Nova Scotia Department of Mines in 1959 it became possible for the first time to attract metal mining exploration capital to the Province on a sustained basis. Mineral exploration is now at an all-time high within the Province, and the work recorded has been climbing steadily in both dollar value and in definitive character for the past six years. At the present time, at least twenty major mining companies have substantial exploration programs in the Province

and many more promotional groups are also active. In addition to these programs practically all the exploratory minded companies represented in Canada feel it necessary to send senior staff here at frequent intervals to keep in touch with developments. Possibly half the funds spent are reported for work credits and with over $800,000 reported in 1964 it can safely be assumed that over $1,500,000 was spent in mineral exploration on land areas during that year. At least as large a sum was additionally spent on off-shore petroleum exploration. The comparable figures for 1965 have not yet been published. However, it is expected that despite increased expenditures for solid mineral exploration, the overall total will show a decrease as a result of curtailed landbased petroleum exploration activities.

The geological division of the Nova Scotia Department of Mines attempts to maintain this expenditure by issuing reports of economic interest, by keeping records of past work in an organized manner so that the information can be utilized, and in general, by bridging the gap between the strictly scientific work done by the Federal Department of Mines and the final assessment of economic value which can best be done by the mining firms themselves.

A feature of interest to industries other than the mining industry is the formation of a groundwater section within the geological division in 1963. This section was organized for the purpose of evaluating and making an inventory of Nova Scotia's water supplies. Within the year requests for assistance in

locating and developing suitable sources of water for industry and municipalities produced a backlog of work that the small staff of the Department of Mines will not be able to complete for at least five years. The systematic inventory originally planned has had to take a secondary place to emergency calls but is proceeding at a rate which is as rapid as a small trained staff can achieve.

The following comparisons will serve to indicate recent and current relationships of the major elements of the provincial mining sector to each other and to Canada as a whole.

For 1962 the Dominion Bureau of Statistics reports that the mining sector of Nova Scotia contributed 10.5% of the provinces net value of production in commodity-producing industries. By this standard mining ranked below manufacturing at 41.3% and construction at 25.2% but above fisheries at 7.6%, agriculture at 6.1% and forestry at 2.9%. More up-to-date figures are not yet available.

In Gross Value of Mineral Production, this sector contributed 67 million dollars to the provincial economy in 1965. This figure has been climbing steadily from a low of 62 million dollars in 1958.

Within the sector, in 1965 coal accounted for almost 63% of the gross value of mineral production, structural materials including all limestones - 13%, gypsum - 11-1/4%, salt - 7-3/4%, barite - 2-3/4%, and metalics - 2-1/4%.

Relating Nova Scotia's mining sector to the National level, it ranks in eighth place with slightly

over 2% of Canada's total mineral production value in 1962. However, in terms of total value of mineral production per square mile of land area, Nova Scotia lead all other provinces in 1961 with $3,140.

For certain minerals, Nova Scotia's production makes a very significant contribution to total production tonnages for all Canada. In this category for 1964, barite leads with 95½%, followed by gypsum with 80%, coal with 38% and salt with 11%.

For a few more interesting comparisons, in 1963 Canada imported 332 thousand tons of salt compared with Nova Scotia's total production of 339 thousand tons. In 1964 Canada imported 14-3/4 million tons of coal compared with Nova Scotia's total output of roughly 4¼ million tons. In 1962 Canada exported nearly 231 thousand tons of barite, compared with Nova Scotia's production of 220 thousand tons.

III. THE WORK OF THE SEGMENT AND SECTOR COMMITTEES

The Mining Sector held its organization meeting at Truro on November 27, 1964. Three segment committees were set up: Coal, with seventeen members; Export Minerals, with five members; and Domestic Minerals, with seven members. Their meetings got underway early in 1965.

Coincident with the activities of both the Coal Segment and Mining Sector committees, senior level coal studies were being carried out under the sponsorship of the Federal Government in co-operation with the Nova Scotia Government, the coal mining companies and the labour representatives. The Coal Segment and Mining Sector Committees did not have access to the information placed before this senior group. Therefore, it must be borne in mind that all conclusions reached by these committees were based solely on information publicly available.

The Segment Committee recognized at the outset that the social aspects of the long standing coal problem dominate the purely economic factors.

The geology and locations of Nova Scotia coal deposits are such that they cannot presently be worked by today's methods with sufficient economy to compete successfully with imported fuels, either solid or fluid in any but strictly local markets without government subventions.

The Coal Segment Committee felt that until alternate employment can be developed for the labour force dependent on coal mining, assistance in one form or another must be continued. No apologies were made

for this conclusion. It was felt that as long as central Canadian manufacturing industries receive tariff protection on manufactured goods help of a compensating nature is justified to enable Nova Scotia coal mines to continue in operation.

With this preliminary conclusion, it was decided by the Coal Segment Committee that the best possible contribution the coal industry can make to the provincial economy, over the next four to eight years, will be to meet the following primary objectives.

The production and marketing of sufficient coal, assisted by the Federal Government, that will permit:

(a) maximum possible production economies;
(b) stabilization of the labour force at a level compatible with social needs;
(c) preservation of the industry in a basic state of readiness.

Little could be done to establish the cost of modernizing the industry beyond noting that it is publicly reported to be aproximately fifteen million dollars for rehabilitating existing mines, and ten million dollars for developing a new mine at Lingan. Also difficulties were experienced in attempting market analysis in an effort to learn which markets could be served best by the various producing localities. However, from the information available, the Coal Segment Committee estimated that production and marketing targets of five million tons annually by 1968 would be required. This assumes a new colliery

at Lingan coming into production late in this period. A larger tonnage would be available by 1975 if a second mine at Lingan were to be developed. This target was considered necessary to maintain minimum employment levels and prevent excessive social distress.

It was estimated that Maritime markets held forth a top potential of two and one-half to three million tons per year by 1972. This would leave a balance of two and one-half to three million tons to be marketed in Quebec and Ontario.

Caution was expressed that the recent strong demand for coal by thermal power plants should not be a cause for any great optimism regarding future markets. This demand developed as a direct result of sub-normal precipitation over the north eastern hydro-power, water-shed areas of North America. This cannot be regarded as a permanent or dependable factor on which to base future planning. In addition, domestic and industrial use markets will continue to shrink, and heavy new blocks of hydro power already are in the construction and planning stages. Finally, nuclear power is rapidly approaching the day when it can compete, unaided, with conventional power sources.

The potential for lowering coal production costs by strip mining received considerable attention. The Coal Segment Committee emphatically insisted that it should not be considered, the reasoning being that the volume suitable for stripping potential was so limited by geography and geology, that strip mining could only have a disruptive influence on current

plans for the industry's long term rehabilitation. After lengthy debate, this negative conclusion was later modified by the Sector Committee to sanction strip mining at some future time should it be warranted by altered conditions.

The Planning Board in reviewing those portions of the mining sector report which pertained to the coal mining industry, was in general agreement with the conclusions reached and the recommendations put forward. However, following considerable discussion, questions arose concerning the ability of the industry's major producer to meet its share of production increases called for in the coal targets.

The Board, in pursuing this subject, raised the more basic question concerning the wisdom of calling for production increases at this time.

In the absence of sufficient firm information with which to resolve these vital questions, the Planning Board appointed a Special Committee on Coal from its membership, (which was representative of the various special interests involved) to make further investigations and report its conclusions.

This committee carried out its directive and its report was subsequently considered and adopted by the Planning Board for inclusion in the First Plan. This report is reprinted in Appendix B of this report.

It should be pointed out that it is not the policy of the Voluntary Economic Planning programme to duplicate studies underway by other government bodies or organizations. In keeping with this policy a detailed analysis of the coal industry was not attempted

since this work was already in the process of being done for the federal cabinet by Dr. J.R. Donald.

The Export Minerals Segment Committee reviewed the past and current status of the gypsum, barite, metallics and peat moss industries. These industries are subsidiaries of parent firms located elsewhere and, therefore, lack complete freedom of action insofar as production volume and marketing are concerned. In gross value these industries contributed roughly twelve million dollars to the provincial economy in 1964, the last year for which firm figures are available.

Most of the industries represented by this segment have recently completed re-development programs. New mines and quarries have been opened and substantial improvements have been made in material handling, processing and transportation.

Excepting metal concentrates, these minerals are of low unit value and the world supply is abundant. Therefore, the future progress of these industries depends heavily on their continuing ability to hold costs down in relation to those of other producing countries and on the development of future markets.

It was concluded that the outlook is reasonably stable with present modest growth rates continuing through the immediate planning period.

Attention was given to the potential for further processing of these materials in Nova Scotia. It was concluded that the prospects for this are not bright.

In the case of gypsum, present Maritime

manufacturing plant capacity is about double the Maritime market demand. By virtue of the high weight, extremely fragile, low unit value nature of the finished products, wider market areas become impractical. In addition, prohibitive American import tariffs exclude effectively such finished products from that market.

It was felt that employment levels within these industries would remain fairly stable over the immediate future despite anticipated modest production gains.

The peat moss industry is experiencing difficulty in overcoming the barrier of high transportation costs in relation to other northeastern producing areas. Nova Scotia possesses a large supply of high quality moss which is not being exploited to nearly its full extent. Its potential for additional uses was thought to be worthy of investigation. Possibilities raised included its use as a binder in pelletizing certain iron ores, and as a superior soil conditioner and fertilizing product when combined with fish plant processing wastes.

The Domestic Minerals Segment Committee experienced difficulties in getting together for a meeting. Consequently, the sector secretary interviewed the members individually and prepared a segment report on the basis of these interviews. This report was subsequently circulated among the committee members for their further suggestions and approval.

In gross value, this Segment currently contributes about thirteen million dollars to the

provincial economy. It includes salt, structural materials, including clay and clay products, all types of limestone and other quarried products. To date, salt and structural materials account for over 98% of this Segment's total value.

In the past, output of this Segment has fluctuated considerably. Salt output has made substantial gains in recent years. Although significant tonnages of industrial and consumer grade salt are produced, total salt production in Nova Scotia is dominated by the demand for highway de-icing salt. Consequently, variable weather factors from year to year cause wide variations in total annual salt production. It is not expected that highway de-icing practices will be expanded to the same extent in the immediate future as has been the case in recent years. Therefore, annual gains in salt production are expected to reduce somewhat.

The demand for construction material aggregates can be expected to rise annually by about 8% of current values, closely paralleling the forecasted growth rate for the Construction Sector.

Elsewhere, there has been a strong trend away from uncontrolled pit-run aggregates toward washed and graded aggregates. Although these improved materials substantially up-grade the end products, the local market has been slow to specify them, presumably because of their higher cost. As a result, those few firms which have installed plants capable of supplying graded aggregates, have experienced difficulties in keeping them busy. However, this situation is likely

to be a temporary one.

These and other mineral deposits are frequently located remote from highway and power services. Provision of these essential services has provided a heavy, and sometimes prohibitive, barrier to enterprises wishing to develop Nova Scotia's more inaccessible mineral resources.

Difficulties in raising development and operating capital are also holding back growth in these and similar mineral resource based industries. In many cases, capital requirements for an economically sized operation are beyond the financial resources of private entrepreneurs. A local money market is needed which can stimulate public interest and participation in such ventures. Until the time that such a market becomes available, progress will be retarded unless public assistance can be extended in some practical manner.

The limestone industry has registered spectacular gains in the last year. New quarries have gone into operation at Brookfield, Irish Cove and Marble Mountain. When final figures are available it is expected they will show between a two and three fold increase for 1965 over 1964. Employment by this industry will not be up proportionately, as a result of the high degree of mechanization that has been carried out. Several other high grade deposits have been mapped and await development plans.

Quarrying and processing operations at Marble Mountain appear to offer bright promise for immediate expansion, providing highway transportation

services can be up-graded to meet the needs of heavy duty vehicle operation. It is essential that this be done without delay, otherwise the opportunities needed to revive this very promising new industry may well be lost. Here is an outstanding opportunity for industry and government to co-operate for the common good of the whole community.

Neither the Export nor Domestic Minerals Segments attempted to evaluate other mineral deposits either known or suspected to occur in Nova Scotia. However, new developments in extraction techniques, refining processes, etc., are taking place at an accelerating rate. Consequently, it can reasonably be expected that some of these will find profitable application to Nova Scotia's mineral resources.

A favourable climate for mineral exploration in Nova Scotia has been created and, currently, such activities are proceeding at an encouraging rate. If this can be coupled with an equally favourable development climate, untapped resources could account for the Mining Sector's greatest future gains.

The Mining Sector Committee met three times during the summer of 1965. Activities were chiefly confined to considering the reports of the three segment committees and adopting their recommendations for inclusion in the sector's report to the Planning Board.

Several additional recommendations of general interest to the three segment committees were put forward and approved at that time.

Of the twenty-three recommendations

forwarded to the Voluntary Planning Board only the following were not accepted for inclusion in the First Plan:

(a) That investigation be given to the feasibility of forming an Atlantic Stock Exchange to promote public interest in mining ventures and to provide a steady source of equity capital.

(b) That a second ferry service to New England, capable of handling high-volume commercial vehicles, be secured.

(This latter recommendation was referred to the Transportation Sector for later consideration.)

In addition to these, several received slight alterations by the Board to put them in more specific form.

The recommendation dealing with coal production targets was decreased by one quarter million tons annually to conform with the conclusions of the Planning Board's Special Committee on Coal.

With these exceptions, all other mining sector recommendations received the Planning Board's approval. A list of these recommendations, re-printed from the First Plan, may be found on page 25 of this report.

IV. POTENTIALS FOR GROWTH

COAL

If the coal industry is to survive for any length of time, it is imperative that more economic use be made of the manpower it employs. This will require a capital investment of major proportions and a more highly skilled labour force, working in full co-operation with a progressive management. If this can be achieved rapidly enough, it might be possible to hold coal output near present levels. Production costs would tend to stabilize, but whether or not significant reductions could be gained is open to debate. The present scale of production is compatible with the mineable reserves in the Sydney coal field, it could be accelerated safely in the Springhill area, and it will exhaust the reserves that can be extracted by conventional methods in the Pictou area within a decade.

INDUSTRIAL MINERALS

These now include gypsum, anhydrite, salt, barite, limestone, dolomite, silica, clays, abrasive sands, fluorspar, marble and refractories. These may also include potash, beryl, magnesite, andalusite, complex potassium and magnesium salts and celestite.

It is reasonable to expect that the growth rate of the past fifteen years will be maintained. Major increases could come with the discovery of mineable potash deposits, with development of an export market for marble, or with production of basic chemicals such as soda ash or caustic soda, particularly for export markets.

Free sulphur bearing ore has been discovered recently in the Truro area and drilling to outline the extent and grade of the ore deposit is now underway.

Newly developed techniques in the separation of barite and fluorite ores give promise that an extensive deposit of these minerals in the Lake Ainslie district of Inverness County may soon be developed into a commercial enterprise.

Potential silica deposits are receiving increased attention in both Halifax and Yarmouth counties. A deposit near Belmont, Colchester County is now supplying silica sand on a small scale for the cement plant at Brookfield.

With these additional discoveries of industrial minerals, plus Nova Scotia's strategic position with respect to both world markets and the waterborne supply of deficient materials, the time would seem to have arrived for the development of a chemical industry. The establishment of such an industry would be an important factor in Nova Scotia's drive to set up a stable foundation on which to build a strong industrial economy.

METALLIC MINERALS

Known to occur in the Province are copper, lead, zinc, silver, manganese, atimony, bismuth, gold, tungsten, lithium, tin, and molybdenum. Active exploration is proceeding for all of these, chiefly in the Cape Breton region. Copper, lead, zinc and silver mining has already been going on successfully at Walton for several years. Partially developed deposits of lead are located at Salmon River and of zinc at

Meat Cove, both in Cape Breton. In addition to these, there are other promising deposits of all the above-mentioned minerals.

It seems very likely that the present intensive efforts of private industry with the backing and encouragement of the Nova Scotia Department of Mines, and the fundamental studies and research of the Canadian Department of Mines and Technical Surveys will result in a substantial increase in metallic mineral production. Timing and extent of such increases depend as much on world economic conditions as on any local factors, particularly in the case of large low-grade deposits.

Iron ore can be written off as far as anything other than minor specialty output is concerned. Our deposits are simply not of grade or size to compete in today's markets.

GROUNDWATER

It can be predicted with reasonable confidence that, if Nova Scotia can show the sustained yields of pure water that is indicated on the basis of initial work, no other single feature will be more attractive to industry within the next two decades. Optimum use of this resource will require not only knowledge of the amount in the Province's aquifers, but the possible rate of recharge, maximum safe rate of use, and protection of the reservoirs from contamination.

Fortunately, the province has started work on the above goals at a stage where these goals are still attainable. In this respect a major advantage

is held over most of North America.

PETROLEUM AND NATURAL GAS

There is well founded evidence that these important minerals may be ultimately discovered in Nova Scotia proper or its surrounding continental shelf. Obviously, no predictions can be made regarding timing, likely quantities or costs. Also, immediate, direct benefit to the province will be minimal unless the control over mineral rights rests firmly in it's hands. It is worth noting that Nova Scotia already enjoys the lowest cost for delivered crude petroleum in North America. An adjacent offshore supply is not likely to change this significantly.

On the other hand, royalty revenues from producing wells could make a substantial contribution to the funds Nova Scotia needs to bring about the rapid development of the economy. Also, it is well to keep in mind that Nova Scotia possesses a range of basic minerals similar to that of Alberta, with one important exception - abundant natural gas. In Nova Scotia's strategic Maritime location, the addition of such a significant resource could have a tremendous influence on the province's future rate of development.

V. MINING SECTOR RECOMMENDATIONS

1. A representative from the Mining Sector Committee should be appointed to the Transportation Sector Committee to ensure that transportation problems relating to coal will receive attention.

2. Smaller independent coal operators should not be prevented from continuing work if they help to alleviate local pockets of unemployment and service a market that would otherwise be lost to coal.

3. In view of efforts now in hand to stabilize the deep mining of coal and the markets concerned, strip mining should be considered only in the distant future, and then only if altered conditions warrant such practices.

4. The Provincial Government should be requested to ensure that supervision and a measure of control be exercised over any public funds advanced by it to the coal mining industry.

5. Maximum benefit cannot be derived from increasing mechanization in coal mines unless the skills of both mining crews and of supervisory staffs are developed commensurately. The initial training program for miners now being sponsored by the Dominion Coal Company Limited, the Nova Scotia Department of Education, The Dominion Coal Board, the Nova Scotia Department of Mines, and the Canada Department of Labour is commended. The need for continuous additional training for miners and officials at various levels of responsibility is stressed. Provision should be made in the technical schools of Cape Breton for establishment of a permanent technical training

section designed to provide the necessary backgrounds and skills for men in industry. Such technical training would be similar to that provided in Ontario by the Haileybury School of Mines, with emphasis changed to meet local needs.

6. Preliminary sparker work was done by the Nova Scotia Research Foundation in 1964 to map the continuity of coal seams: this work should be continued and extended both on the west coast of Cape Breton Island between Port Hood and Chimney Corner and on the east coast between Point Aconi and Cape Morien.

7. The Fuels and Mining Practice Division of the Canada Department of Mines and Technical Surveys should be requested to undertake fundamental research on extractive methods beyond any known at present.

8. The intensive efforts of the Nova Scotia Department of Mines and the Nova Scotia Technical College to ensure that Nova Scotia coal is utilized for heat and power in combustion chambers designed to give maximum efficiency should be continued and extended to ensure the retention of existing coal markets as far as possible.

9. The Nova Scotia Technical College should be requested to institute research into the use of Nova Scotia peat moss for the pelletizing of iron ore.

10. Studies should be made in conjunction with the fishing and the agricultural industries to determine the economic feasibility of producing fertilizers from peat moss and fishery waste. The Nova Scotia Research Foundation should be asked to institute these studies.

11. The Nova Scotia Research Foundation should study possible additional uses for anhydrite.

12. (a) The Canada Department of Transport should be requested to investigate the possibility of improving and deepening the Walton Harbour facilities sufficiently to accommodate 6,000 to 10,000 ton ships.

(b) No additional royalties, port or wharfage charges should be imposed on the operations of this industry.

13. A continuing survey should be made of potential markets for Nova Scotia's minerals, and for processed chemicals or materials that can be derived from these. This survey should be directed by a mineral economist of ability who would be attached to the Nova Scotia Department of Mines staff.

14. A ten-year period of exploration by the Nova Scotia Department of Mines should be begun in the Cape Breton National Park to determine if any areas should be taken out as mineral land. Any areas released for mineral development would be replaced by equivalent areas such as Cape Smokey.

15. Existing development agencies should be encouraged to assist private enterprise with the dual problems of access roads and power installation, wherever warranted by the interests of the provincial economy, on a basis similar to that which is already available in other areas of the economy.

16. The inventories of industrial minerals, including water, now underway and planned by the Nova Scotia Department of Mines, together with the necessary laboratory work to back up field observations,

should be accelerated as rapidly as staff can be secured and integrated into such a programme.

17. * The importance of specifying quality controlled construction aggregates in accordance with accepted building codes should be stressed to all concerned with their use.

NOTE: The following are extracted from the Board's Special Committee on Coal Report which is reproduced in Appendix B.

18. Continuing subventions for coal are vitally necessary.

19. The Federal Government should be urged to make long-term commitments regarding coal subvention policies in order that the marketing situation may be sufficiently stabilized to permit sound, long-range planning.

20. Federal Government assistance is necessary for the immediate rehabilitation of the existing coal mines and the development of a new mine at Lingan.

21. It is recognized that the Nova Scotia coal problem is a social as well as an economic problem and that labour force reductions over time are inevitable. It is recommended that:

(a) Where technological change is planned that will cause unemployment, prior knowledge of such plans should be available to the employees.

(b) Planning for the orderly re-employment

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* This recommendation referred back to sector for industry self-implementation.

of any displaced labour must be emphasized and should begin at once.

(c) Where necessary relocation transportation for the worker and his family should be provided.

(d) Displaced worker retraining programmes should be instituted.

(Recommendation 21 is a combination of recommendation No. 7 - Mining Sector Report - as passed by the Planning Board and recommendation No. 4 - Special Coal Committee Report.)

22. After a full review of all available information and with due regard to the strong coal market outlook to 1972 it was found that production targets cannot be set at this time with any degree of exactness. For this interim period, therefore, an annual production target of 4.5 to 5.0 million tons should be planned together with a further up-grading of average mine productivity to 4.5 tons per man day.

VI. SECTOR TARGETS - 1965 TO 1968

The Voluntary Planning Board has set targets for the Mining Sector which were based on projections submitted to it by the Mining Sector Committee.

These targets are set out in detail for the various mineral industry classifications in Tables A-4 and A-5, Appendix A. In aggregate for the whole sector they are as follows:

AGGREGATE TARGETS
GROSS VALUE OF PRODUCTION AND EMPLOYMENT
MINING SECTOR - NOVA SCOTIA 1965 TO 1968

Year	Gross Value ($'000 Current)	± % Change	Employment	± % Change
1965	67,167	+ 0.7	7,997	+ 13.5
1966	68,598	+ 2.1	7,801	- 2.5
1967	70,172	+ 2.3	6,345	- 18.6
1968	72,034	+ 2.7	6,110	- 3.7
		(+ 7.0)		(- 15.8)

Note - Complete data are given in Tables A-4 and A-5. ±% is percentage change over previous year, (±%) is percentage change over 1963 base year.

Before proceeding with further comment on these targets a few observations concerning the obstacles and hazards encountered in setting them may prove helpful. The available statistical data are such that it is most difficult to establish either the current situation of some of the dominating industries involved, or the true historical trends which have

been in operation. In addition, mineral deposits which at the present time are lying unknown or dormant could well become highly significant contributors to the sector within the target periods.

These problems are further compounded by the present state of flux within the coal mining industry. At the time these targets were approved it was assumed that the federal coal mine redevelopment programme would be started early in 1966. To date, this has not taken place. Allowance, therefore, must be made for this delay when examining these targets which are set out in detail in tables A-4 and A-5, Appendix A. Also it must be kept in mind that when these targets were approved, 1965 data was not then available. Some preliminary 1965 data has since been released and has been added to the historical section of the target tables. Undue significance should not be attached to this data however. To illustrate DBS preliminary estimates of gypsum gross value of production in 1965 show a decline of 7.8% under 1964. Contrary to this indicator, those close to the industry feel that production continued to make gains in 1965. That gypsum production did in fact gain, is further indicated by 1965 Nova Scotia fiscal year estimates of gypsum tax revenue. These show a 1.7% gain over 1964 fiscal year returns.

Returning to coal, for target setting purposes, it was assumed that the promised federal redevelopment aid would enable the industry to carry out its basic planning. That is, the rehabilitation of the existing mines plus the opening of a new mine at

Lingan, all to be carried out over a five year period, commencing in the spring of this year. On the basis of this it was assumed that production could be expected to show its first increase in 1967, and that it would rise at an accelerating rate from then until 1972, by which time it would stabilize at between 4½ to 5 million tons per year.

Looking at employment projections, it should first be pointed out that on the advice of the industry, a constant factor of 220 shift days per year was used in calculating all labour force projections. However, recent yearly averages of this figure have been somewhat higher, ranging from a low of 216 in 1961 to a high of 254 in 1964. In calculating labour force projections, the use of this lower shift days per year figure results in an apparent jump in man power requirements which will not materialize if this average figure remains at current values.

It was assumed that labour productivity values would drop in the initial phases of redevelopment and then take a sharp rise as the results of redevelopment work would begin to show. It is now extremely doubtful that this will take place as early as the forecasts indicate. Labour force increases shown for 1972 result from the assumption that in the later stages of the medium range forecast period, production would by then be increasing at a faster rate than productivities. The labour force projections for 1972 are based on a forecast annual production of 4-3/4 million tons of coal and a production rate of 4½ tons per man day with each man working an

average of 220 days per year. On this basis, total labour force requirements will shrink by approximately 1500 men over the forecast period.

Turning to gypsum, a straight line growth rate of roughly 4% of 1964 production value was used throughout the projection years. A comparable employment rise was not forecast because of the highly automated nature of these industries.

The performance of structural materials is largely dependent on activity in the construction sector. Between 1947 and 1964, the gross value of production of structural materials has increased at an average rate of 3½% per year, based on 1964 production values. For target setting purposes it was assumed that with greatly increased output of limestone materials and causeway aggregate materials, 1965 would see a substantial jump in output which would taper off in succeeding years to an annual growth rate of roughly 8% per year in terms of 1964 production levels.

Salt output on the other hand is expected to increase less rapidly over the forecast period, than has been the case in the immediately preceding years. An average yearly gain of 4% of 1964 production levels has been forecast.

Barite is also forecast to make only modest yearly gains of roughly 3%. This figure may well be improved if the Lake Ainslie deposits can be brought into production in the near future.

The outlook for metallic mineral output is subject to similar qualifications. Gains of the present single producer are expected to average about

4% per year in terms of gross value of production. Part of this increase will be the result of a slightly faster gain in metallic mineral prices as compared with non-metallic mineral prices.

In aggregate, and making no allowances for new developments within the mining sector, the gross value of production of the sector is expected to make gains of only one to two percent per year. The employment picture is far less encouraging. Anticipated further reductions in coal mine employment are likely to be offset by the relatively minor gains in the other mining industries.

As things currently stand substantial gains within the mining sector must come from new discoveries of mineral deposits, from new uses for those minerals which Nova Scotia is known to possess in abundant supply, or preferably from both. In view of the current level of exploration activity plus a growing interest in Nova Scotia as a manufacturing base the possibilities for such developments taking place seem very promising indeed.

TABLE A-1

MINERAL PRODUCTION - GROSS VALUE - NOVA SCOTIA

Year	Coal Quan. '000 tons	Coal Value '000 $	Gypsum Quan. '000 tons	Gypsum Value '000 $	Structural Materials[1] Quan. '000 tons	Structural Materials[1] Value '000 $	Salt Quan. '000 tons	Salt Value '000 $	Barite Quan. '000 tons	Barite Value '000 $	Metallics Value '000 $	Others[2] Value '000 $	Total[3] Value '000 $
1947	4,118	27,175	2,138	2,303	3,346	2,724	40	416	126	1,354	45	238	34,256
1952	5,905	51,228	2,969	4,374	1,915	3,351	139	1,566	135	1,508	2,136	391	64,552
1953	5,785	51,998	3,051	5,200	1,716	3,318	128	1,272	244	2,167	3,004	405	67,364
1954	5,843	51,938	3,168	5,236	11,089	8,787	151	1,839	216	1,888	3,517	246	73,451
1955	5,731	49,853	3,839	6,062	1,524	3,191	145	1,808	244	2,038	3,884	297	67,134
1956	5,775	50,931	4,144	5,251	2,084	3,817	133	1,653	308	2,743	1,302	394	66,092
1957	5,686	52,878	3,842	6,006	2,368	4,313	123	1,901	211	2,560	1.5	401	68,059
1958	5,270	50,348	3,150	3,259	2,769	4,895	126	2,027	179	1,862	4.4	311	62,707
1959	4,392	43,731	5,036	6,463	9,426	8,394	120	1,898	216	2,067	Nil	327	62,880
1960	4,570	44,981	4,490	7,515	9,633	9,337	164	2,256	131	1,242	0.1	122	65,454
1961	4,301	41,716	4,113	5,694	6,596	9,753	226	2,659	176	1,648	Nil	223	61,693
1962	4,205	41,713	4,451	7,114	4,925	6,833	313	3,113	220	2,067	1,685	178	62,703
1963	4,622	45,103	4,926	8,417	6,513	6,706	339	3,923	166	1,612	1,443	104	67,308
1964	4,344	43,357	5,117	9,101	6,868	6,484	431	4,740	187	1,822	1,554	184	66,713
1965	4,134	42,126	4,806	7,609	7,563	8,700	469	5,172	184	1,781	1,521	105	67,014

Source: DBS 26-201, 26-203. Excepting coal, data for 1963, to 1965 are preliminary estimates.

Note 1 - "Structural Materials" data includes all limestones, and dollar values for clays, but not clay tonnages.

Note 2 - "Others" - composed only of quartz and peat moss for recent years.

Note 3 - All component mineral values are rounded and may not total exactly. In the absence of an appropriately weighted price index applicable to Nova Scotia mineral products, only current dollar series are presented.

Net value added-approximately 80% of total value.

TABLE A-2

EMPLOYMENT DATA[1] - MINING SECTOR

AVERAGE NUMBER OF EMPLOYEES

Year	Coal[3]	Gypsum[2]	Structural Materials & Limestones	Salt[2]	Barite[2]	Metallics[2]	Others[6]	Totals[5]
1947	10,045	671	570	146	101	--	183	11,716
1952	11,602	717	569	180	153	276	301	13,578
1953	11,231	685	290	186	128	260	257	13,057
1954	10,637	693	701	189	140	245	268	12,859
1955	10,075	720	263	147	165	226	301	11,095
1956	9,983	761	352	152	189	157	76	11,670
1957	9,161	725	591	148	200	--	167	10,127
1958	8,912	507	537	102	147	--	5	10,074
1959	7,535	666	360	149	118	--	152	8,980
1960	7,864	535	238	152	104	--	49	8,982
1961	7,203	565	212	192	18	11	51	8,322
1962	6,408	494	174	165	105	16	--	NA
1963	6,062	556	NA	225	91	22	--	NA
1964	6,217	625	NA	204	98	23	--	NA
1965	6,210	560	NA	217	71	23	--	

Note 1 - This table intended as a guide only. It is compiled from a combination of DBS data and Nova Scotia Department of Mines data. These sources are not always compatible.

Note 2 - Source - Nova Scotia Department of Mines Annual Reports.

Note 3 - Source - DBS 26-206, 45-002.

Note 4 - Source - DBS 26-215, 26-217.

Note 5 - Source - DBS 26-201.

Note 6 - By deduction of sum of preceding column from totals.

TABLE A-3

SALARIES AND WAGES

($'000 Current)

MINERAL INDUSTRIES

Year	Coal [1]	Gypsum [2]	Structural Materials & Limestones [3]	Salt [2]	Total [4]
1947	24,208	1,118	552	NA	21,637
1952	35,709	1,894	775	NA	40,857
1953	34,183	1,853	679	NA	39,237
1954	31,856	1,960	2,195	555	38,483
1955	30,051	2,041	610	560	35,221
1956	29,168	2,515	913	576	34,142
1957	29,068	2,020	987	446	33,859
1958	29,141	1,572	909	498	32,413
1959	23,769	2,515	991	368	27,958
1960	25,307	2,258	906	648	29,279
1961	23,151	2,125	779	756	27,299
1962	22,583	2,082	547	649	NA
1963	24,287	2,699	NA	909	NA
1964	25,257	NA	NA	NA	NA

Note 1 - Source - DBS 26-206

Note 2 - Source - Nova Scotia Department of Mines Annual Reports.

Note 3 - Source - DBS 26-215, 26-217.

Note 4 - This data is taken from DBS 26-201 catalogues and is reported to include the entire Mineral Industry of Nova Scotia. However these totals are obviously incompatible with the components of the various mineral classes as listed. They are included only to illustrate general trends.

TABLE A-4

SECTOR TARGETS

GROSS VALUE - MINERAL PRODUCTION

($'000 Current)

Year	Coal[2] Value ± %	Gypsum Value ±	Structural Materials[3] Value ± %	Salt Value ± %	Barite Value ± %	Metallics Value ± %	Others Value ± %	Total Value ± %
				HISTORICAL				
1960	44,981 --	7,515 --	9,337 --	2,256 --	1,242 --	-- --	122 --	65,454 --
1961	41,716 -7.3	5,694 -24.2	9,753 + 4.4	2,659 +17.9	1,648 +32.6	-- --	223 +84.3	61,693 -5.7
1962	41,713 0.0	7,114 +25.0	6,833 -30.0	3,113 +17.1	2,067 +24.8	1,685 --	178 -20.0	62,703 +1.6
1963	45,103 +8.1	8,417 +18.3	6,706 - 1.9	3,923 +26.0	1,612 -22.0	1,443 -14.4	104 -41.6	67,308 +7.3
1964[1]	42,828 -5.0	9,101 + 8.1	6,484 - 3.3	4,740 +20.7	1,822 +13.0	1,554 + 7.7	184 +75.5	66,713 -0.9
1965[1]	42,126 -1.6	7,609 - 7.8	8,700 +34.1	5,172 + 9.1	1,781 - 2.5	1,521 - 2.1	105 -42.9	67,014 +0.5
				PROJECTIONS				
Short Range to 1968								
1965	40,900[2] -4.5	9,485 + 4.2	7,863 +21.4	5,170 + 9.1	1,937 + 3.3	1,622 + 4.4	190 + 3.3	67,167 +0.7
1966	40,900 0.0	9,870 + 4.1	8,555 + 8.8	5,390 + 4.4	1,997 + 3.1	1,690 + 4.2	196 + 3.2	68,598 +2.1
1967	41,300 + 1.0	10,255 + 3.9	8,990 + 5.1	5,610 + 4.1	2,057 + 3.0	1,758 + 4.0	202 + 3.0	70,172 +2.3
1968	42,000 + 1.7 (-6.9)	10,640 + 3.8 (+26.4)	9,413 + 4.7 (+40.2)	5,830 + 3.9 (+48.6)	2,117 + 3.0 (+31.3)	1,826 + 3.9 (+26.5)	208 + 2.9 (+100.0)	72,034 +2.7 (+7.0)
Medium Range to 1972								
1972	47,500 (+5.3)	12,180 (+44.5)	10,813 (+61.2)	6,710 (+71.0)	2,357 (+46.2)	2,098 (+45.3)	232 (+128.0)	81,890 (+21.6)

± is change over preceding year. (± %) is change over 1963 base year.

Note 1 - 1964 and 1965 values are preliminary estimates.

Note 2 - All Gross Value projections for coal are based on a constant 10 dollar per ton valuation.

Note 3 - Structural Materials include limestones.

TABLE A-5

SECTOR TARGETS

EMPLOYMENT - MINERAL INDUSTRIES

Year	Coal[1] Number	± %	Gypsum[3] Number	± %	Structural Materials[2] Number	± %	Salt[3] Number	± %	Barite[3] Number	± %	Metallics[3] Number	± %	Others Number	± %	Total	± %
HISTORICAL																
1960	7,864		555		258		152		104		--		49		8,982	
1961	7,203	- 8.4	565	+ 1.8	212	-17.8	192	+26.3	88	-15.4	11		51	+ 4.1	8,322	- 7.3
1962	6,408	-11.0	494	-13.4	174	-17.9	165	-14.0	105	+ 8.0	16	+45.4	29	-44.0	7,391	-11.2
1963	6,062	- 5.4	596	+20.6	231	+32.7	225	+36.3	91	-13.3	22	+25.0	32	+10.3	7,259	- 1.8
1964[4]	6,217	+ 2.6	623	+ 4.5	250	+ 8.2	204	- 9.3	98	+ 7.7	23	+ 4.5	32	0.0	7,447	+ 2.6
1965[4]	6,280	+ 1.0	500	-19.5	NA	--	217	+ 6.4	71	-27.6	23	0.0	NA	--	--	--
PROJECTIONS																
Short Range to 1968																
1965[5]	6,650	+ 6.9	629	+ 1.0	350	+40.0	210	+ 2.8	101	+ 3.6	24	+ 4.3	33	+ 3.1	7,997	+13.5
1966	6,420	- 3.5	635	+ 1.0	370	+ 5.7	214	+ 1.9	103	+ 2.0	25	+ 4.2	34	+ 3.0	7,801	- 2.5
1967	4,930	-23.2	641	+ 0.9	390	+ 5.4	218	+ 1.9	105	+ 1.9	26	+ 4.0	35	+ 2.9	6,345	-18.6
1968	4,660	- 5.5	647	+ 0.9	410	+ 5.1	222	+ 1.8	108	+ 2.9	27	+ 3.8	36	+ 2.9	6,110	- 3.7
		(-23.1)		(+8.5)		(+72.5)		(-1.4)		(+18.7)		(+22.7)		(+12.5)		(-15.8)
Medium Range to 1972																
1972	4,800	(-20.8)	671	(+12.6)	490	(+101.2)	238	(+5.8)	120	(+31.9)	31	(+40.8)	40	(+40.0)	6,390	(-11.9)

± % is change over previous year. (± %) is change over 1963 base year.

Note 1 - 1960 to 1964 - Source DBS 26-206. 1965 DBS 45-002.
1972 - Forecasts based on annual production of coal - 4½ million tons, average annual shift days 220, productivity 4½ tons/man/day.

Note 2 - 1960 to 1962 - DBS 26-215, 26-217. 1963, 1964 - estimated. Includes limestones.

Note 3 - 1961 to 1965 - Nova Scotia Department of Mines.

Note 4 - Data is preliminary and subject to change.

Note 5 - Original projections retained for comparison with data subsequently released on a preliminary basis.

REPORT OF*
VOLUNTARY PLANNING BOARD
SPECIAL COMMITTEE ON COAL

The Planning Board devoted particular attention to the problems confronting the Nova Scotia coal industry. The segment and sector committees penetrated as deeply as possible into these problems but their efforts were somewhat hampered by the uncertainties prevailing at the time these studies were conducted.

Several developments had taken place during the interval between the completion of the sector studies and the Planning Board's consideration of the Mining Sector Report. Consequently, the Planning Board appointed a Special Committee on Coal to give further study to these developments in order that it might have the benefit of the best and most recent information available before coming to a decision on matters affecting this important segment of the Nova Scotia economy.

The long-range market outlook for coal is decidedly uncertain. For the immediate future, however, under the present Federal Government subvention policy, markets may continue to outstrip production capabilities. An abnormally low rainfall over north-eastern hydro-power watersheds coincident with an unprecedented surge in the national economy has

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* Note 1 and Note 2 have been added to update report.

resulted in an accelerated demand for thermal power.

Among those vitally concerned with the future of the industry, this seemingly healthy market situation has given rise to an expanding wave of optimism. Unfortunately, this optimism is not entirely justified by the facts. The market itself is highly artificial since it is almost wholly dependent on Federal Government subvention assistance payments. These payments are authorized by Orders-in-Council, are limited to a ceiling of 18 million dollars annually[1] for all of Canada (of which Nova Scotia currently receives over 80 per cent) and are guaranteed only to April 1, 1970. Moreover, the Special Committee on Coal has been advised that increases in this ceiling are becoming less and less likely. Superimposed on these uncertainties is the growing use of nuclear fuels. These are expected to provide the energy source for all new major thermal power installations within fifteen years.

Concerning coal production, 85 to 90 per cent of Nova Scotia's annual production comes from the DOSCO mines. As a direct result of substantial losses over recent years, this firm has been unable to do sufficient maintenance and development work to enable these mines either to produce at maximum efficiencies or to increase their output. A major infusion of new capital for rehabilitation of existing mines and the opening of a new mine at Lingan is

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Note 1 - This has since been increased to 22.5 million dollars.

vitally necessary if the recent trends of decreasing production and rising costs are to be either checked or reversed.

The Federal Government has very recently announced a 25 million dollar programme for this purpose over the next five years. While nothing is known concerning the detail and time scheduling of these funds, if they are released over a three-year period starting early in 1966, the full benefits of this programme will not be realized before 1971. Four years is estimated to be the time required to bring a new Lingan colliery to full production. Once this work has been completed, it has been estimated that 3.8 million tons of coal production per year can be expected from the DOSCO mines. The smaller independent mines have an additional potential of from one-half to three-quarters of a million tons of production per year.

Again, if this redevelopment programme takes place as assumed, it is estimated that it may be possible to increase the current productivity figure of 2.8 tons per man day to 3.8 tons per man day by 1968. The ultimate productivity target is thought to be in the region of 4.5 to 4.7 tons per man day for the DOSCO operations.

The effects of such productivity increases cannot be accurately evaluated at the present time. One line of thinking holds that it will result in cost reductions of up to three dollars per ton of coal mined. If this proves to be correct, the capital costs of redevelopment could be retired over a two to

four year period and subvention costs could be substantially reduced thereafter. Another line holds that possible production cost reductions may well be offset by increased labour, transportation and other costs.

Present pit head cost of coal is estimated to be about $11.80[2] per ton. To compete on a thermal basis with residual fuel oils, coal must be delivered to thermal plants in Nova Scotia at a price of between $8.00 and $9.00 per ton and slightly higher for plants located in Quebec and Ontario. In any case, it is generally acknowledged that coal cannot become competitive without some degree of public assistance.

In planning for a resource-based industry of this nature, the matter of resource reserves becomes very important. In the case of Nova Scotia, it is evident that the limiting factor is not the physical volume of these reserves; rather it is their physical location (extending outward and downward beneath the sea bed), and the extent to which these reserves can be worked safely and economically by known extraction methods.

It is conservatively estimated that with rehabilitation of the existing mines, sufficient workable reserves remain to extend the life of these mines another fifteen years, for a total coal recovery over this period of roughly fifty million tons. A new Lingan operation, producing slightly more than one

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Note 2 - This figure now reported to be in excess of $13.00 per ton.

million tons annually would have a conservatively estimated life span of thirty years. The Acadia Coal Company Limited operations in Pictou County are estimated to have roughly five more years of life remaining.

Employment in the coal industry has dropped from 12,000 men in 1948 to roughly 6,000 men at the present time. Coal production over this same period has dropped from 6.4 million tons to slightly over 4.0 million tons. In 1964, Nova Scotia markets absorbed about 38 per cent of Nova Scotia production, the remaining Maritime provinces about 8 per cent, Quebec 35 per cent and Ontario 19 per cent. The Maritime coal market is forecast to require over 2.0 million tons by 1972 as compared with 1.9 million tons in 1964.

Several possible alternatives in future planning for this industry over the next fifteen years have been raised.

(1) The rehabilitation of the existing mines coincident with the development of a new mine at Lingan, to provide in total four million tons of coal annually.

Estimated total cost (subvention payment, maritime freight rate assistance payments, capital assistance payments, etc.) to the federal treasury over a fifteen year period - 425 million dollars.

(2) The rehabilitation of the existing mines only and limiting production from these mines to the coal needs

of the Maritime Provinces.

Estimated total cost - 230 million dollars.

(3) The rehabilitation of Princess Mine only and the development of a new mine at Lingan, with total production limited, as in alternative two.

Estimated total cost - 220 million dollars.

By adopting either alternative two or three, a saving of roughly 200 million dollars would seem to be possible. This then raises two obvious questions:

(a) Can the funds from these savings be more beneficially utilized in stimulating the Cape Breton economy, than if they are used by adopting the first alternative?

(b) If the coal industry crisis is postponed a further fifteen years, will it then be more, or less difficult to provide employment for those dependent on this industry?

The answers to these questions, while they may appear to be obvious at first glance, are by no means so self-evident and clear cut. The provincial economy is still in the process of trying to provide productive employment for roughly 6,000 men who have been displaced by coal mine closures over the past ten to fifteen years. Additional strains will be felt in absorbing those workers who will lose jobs as a result of planned mine mechanization and up-grading of productivities. If, in addition to this, production was suddenly to be halved, the impact on the Cape Breton

economy would be disastrous.

There is as yet no strong, growing base of industrial activity in Cape Breton capable of absorbing a displaced labour force of this magnitude. Moreover, such a base cannot be brought into being quickly. It will take time to establish one on a sound basis.

Consequently, in reaching its conclusions the Special Committee on Coal felt that the far-reaching social implications of the whole coal problem must be given precedence over the purely economic implications. The following recommendations were therefore considered to be of an interim nature only, covering the immediate planning period. They are designed primarily to reduce social distress until such time as more viable forms of employment can be made available to those whose livelihood is dependent on the coal industry.

Recommendations:

(1) Continuing subventions for coal are vitally necessary.

(2) The Federal Government should be urged to make long-term commitments regarding coal subvention policies in order that the marketing situation may be sufficiently stabilized to permit sound, long-range planning.

(3) Federal Government assistance is necessary for the immediate rehabilitation of the existing coal mines and the development of a new mine at Lingan.

(4) It is recognized that labour force reductions over time are inevitable and, therefore,

planning for the retraining and orderly re-employment of this displaced labour should begin at once and receive strong emphasis.

(5) After a full review of all available information and with due regard to the strong market outlook to 1972 it was found that production targets cannot be set at this time with any degree of exactness. For this interim period, therefore, an annual production target of 4.5 to 5.0 million tons should be planned together with a further up-grading of average mine productivity to 4.5 tons per man day.